Please **REPLACE** the paragraph starting on page 7, line 14 with the following paragraph:

The peak detection unit 260 detects a unidirectional movement of the piston so as to minimize the circuit size, and is provided with a diode D3, a resistor R9, a capacitor C2, and a resistor R10. The diode D3 is connected to the output terminal of the operational amplifier IC2 of the low pass filter 250 to half-wave rectify the output signal from the operational amplifier IC2. The resistor R9 is serially connected between an output terminal of the diode D3 and the control unit 330. The capacitor C2 is connected between the output terminal of the peak detection unit 260 and the ground so as to smooth the output signal from the peak detection unit 260. The resistor R10 is connected between the output terminal of the diode D3 and the ground.

IN THE CLAIMS:

Please REPLACE claims 1-7 and ADD new claims 8-27 as follows:

1. (ONCE AMENDED) An apparatus for controlling a linear compressor with a piston and a valve, comprising:

a collision detection unit detecting a collision of the piston with the valve due to operations of the linear compressor by comparing a peak amplitude of the piston with a preset value;

a control unit determining whether the collision of the piston occurs based on an output signal from the collision detection unit, and resetting maximum amplitude data of the piston of the linear compressor when the collision occurs; and

a compressor driving unit controlling a maximum amplitude of the piston of the linear compressor under a control of the control unit.

2. (ONCE AMENDED) The apparatus according to claim 1, further comprising:

a first storage unit storing preset maximum amplitude data; and

a second storage unit storing reset maximum amplitude data from the control unit, the second storage unit being a non-volatile memory to read/write data.

3. (ONCE AMENDED) An apparatus for controlling a linear compressor, comprising:

a collision detection unit detecting a collision of a piston with a valve due to operations of the linear compressor;

a control unit determining whether the collision of the piston occurs based on an output signal from the collision detection unit, and resetting maximum amplitude data of the piston of the linear compressor when the collision occurs; and

a compressor driving unit controlling a maximum amplitude of the piston of the linear compressor under a control of the control unit,

wherein the collision detection unit includes:

a bridge unit having first and second coils serially connected to a ground, and first and second resistors connected in parallel with the first and second coils and serially connected to each other;

a core linearly reciprocating by penetrating the first and second coils according to a movement of the piston of the linear compressor and made of a magnetic substance;

a sine wave generating unit providing a sine wave to the first resistor and the first coil;

first and second half-wave rectifying units, each comprising a diode half-wave rectifying an output signal from a junction of the first and second resistors, and an output signal from the junction of the first and second coils, respectively;

a differential amplifying unit differentially amplifying output signals from the first and second half-wave rectifying units;

a low pass filter removing a high frequency component of an output signal from the differential amplifying unit; and

a peak detection unit detecting a peak of an output signal from the low pass filter, and outputting a detected result to the control unit.

4. (ONCE AMENDED) The apparatus according to claim 3, wherein the peak detection unit includes:

a diode half-wave rectifying the output signal from the low pass filter;

a third resistor serially connected to an output terminal of the diode;

a capacitor connected between an output side of the third resistor and ground to perform a smoothing operation; and

a fourth resistor connected between the output terminal of the diode and the ground.

5. (ONCE AMENDED) An apparatus for controlling a linear compressor with a core, comprising:

a collision detection unit detecting a collision of a piston with a valve due to operations of the linear compressor;

a control unit determining whether the collision of the piston occurs based on an output signal from the collision detection unit, and resetting maximum amplitude data of the piston of the linear compressor when the collision occurs;

a compressor driving unit controlling a maximum amplitude of the piston of the linear compressor under a control of the control unit;

a differential amplifying unit differentially amplifying output signals according to a detected position of the core;

an amplitude calculation unit calculating an amplitude of the piston based on an output signal from the differential amplifying unit, and providing the calculated amplitude to the control unit; and

a displacement calculation unit calculating a displacement of the piston according to a calculation result from the amplitude calculation unit, and providing the calculated displacement to the control unit.

6. (ONCE AMENDED) A method of controlling a linear compressor, comprising :

presetting a maximum amplitude by an electronic control of a piston of the linear compressor;

detecting a signal when the linear compressor operates;

determining whether any collision of the piston has occurred by comparing a signal corresponding to a preset maximum amplitude and the detected signal;

resetting the maximum amplitude if a collision of the piston is determined to have occurred at the determining; and

driving the linear compressor according to a reset maximum amplitude.

7. (ONCE AMENDED) A method of controlling a linear compressor, comprising:

presetting a maximum amplitude by an electronic control of a piston of the linear compressor;

detecting a signal when the linear compressor operates;

determining whether any collision of the piston has occurred based on the detected signal;

resetting the maximum amplitude of the piston if a collision of the piston is determined to have occurred at the determining; and

driving the linear compressor according to a reset maximum amplitude,

wherein the resetting of the maximum amplitude includes resetting a current maximum amplitude by subtracting the preset maximum amplitude from a previous maximum amplitude so as to prevent the collision of the piston.

8 . (NEW) An apparatus for controlling a linear compressor with a piston and a valve, comprising:

a detection unit detecting a collision of the piston with the valve during operation of the linear compressor according to at least a peak amplitude of the piston;

a control unit determining whether the collision of the piston occurs based on an output signal from the detection unit, and resetting maximum amplitude data of the piston of the linear compressor when the collision occurs; and

a compressor driving unit controlling a maximum amplitude of the piston according to output signals from the control unit.

9. (NEW) The apparatus according to claim 8, further comprising:

first and second storage units to store a preset amplitude value and a reset amplitude value, respectively, when the collision is determined by the control unit.

10. (NEW) The apparatus according to claim 9, wherein at least the second storage unit is a non-volatile memory to read data from and write data to the control unit.

11. (NEW) The apparatus according to claim 8, wherein the detection unit comprises:

a bridge circuit having first and second coils serially connected at respective first terminals of the first and second coils, and first and second resistors connected in parallel with the first and second coils and serially connected to each other at respective first terminals of the first and second resistors;

a core linearly reciprocating by penetrating the first and second coils, a position of the core corresponding to a position of the piston of the linear compressor and magnetically coupling with the first and second coils;

a sine wave generating unit energizing the bridge circuit at second terminals of the first and second coils, respectively;

first and second rectifying units connected to the respective first terminals of the first and second coils and the respective first terminals of the first and second resistors, respectively to rectify output signals thereof;

a differential amplifying unit differentially amplifying output signals from the first and second rectifying units;

a low pass filter removing a high frequency component of an output signal from the differential amplifying unit; and

a peak detection unit detecting a peak of an output signal from the low pass filter, and outputting a detected result to the control unit.

12.. (NEW) The apparatus according to claim 8, wherein the detection unit comprises:

a position detection circuit detecting a position of a core by a differential signal provided by first and second coils when the core is linearly reciprocating by penetrating the first and second coils and the first and second coils are excited by an external source;

a low pass filter removing a high frequency component of the differential signal; and

a peak detection unit detecting a peak of the differential signal output from the low pass filter, and outputting a detected result to the control unit.

13. (NEW) The apparatus according to claim 12, wherein the peak detection unit comprises:

a diode rectifying the output signal from the low pass filter;

a resistor serially connected between an output terminal of the diode and an output of the peak detection unit;

a capacitor connected between an output side of the resistor and a first voltage level to smooth the output of the peak detection unit; and

a second resistor connected between the output terminal of the diode and the first voltage level.

14. (NEW) The apparatus according to claim 12, wherein the position detection circuit produces the differential signal proportional to a change in the position of the core by magnetic coupling between the core and each of the first and second coils.

15 . (NEW) The apparatus according to claim 8, wherein the detection unit comprises:

a differential amplifying unit differentially amplifying output signals, the output signals corresponding to a detected position of the piston;

an amplitude calculation unit calculating an amplitude of the piston based on an output signal from the differential amplifying unit, and providing the calculated amplitude to the control unit; and

a displacement calculation unit calculating a displacement of the piston according to a calculation result from the amplitude calculation unit, and providing the calculated displacement to the control unit.

16 . (NEW) The apparatus according to claim 15, wherein the control unit prevents the collision of the piston with the valve, and controls the displacement of the piston and/or amplitude of the piston by results of the detection unit.

17. (NEW) An apparatus for controlling a linear compressor with a piston and a valve, comprising:

a detector to detect a peak amplitude of the piston;

a control unit determining whether a collision of the piston and valve occurs according to the peak amplitude of the piston detected by the detector, and resetting maximum amplitude data of the piston when the collision is determined; and

a driving unit driving the piston according to the detected peak amplitude of the piston.

18. (NEW) A method of controlling a linear compressor, comprising:

setting a maximum amplitude of a piston of the linear compressor;

driving the linear compressor according to a set maximum amplitude;

detecting a signal corresponding to a position of the piston;

determining whether any collision of the piston has occurred by comparing a signal corresponding to a preset maximum amplitude and the detected signal;

resetting the maximum amplitude if the collision of the piston is determined to have occurred at the determining; and

driving the linear compressor according to a reset maximum amplitude to prevent the collision of the piston.

19. (NEW) The method according to claim 18, wherein the resetting of the maximum amplitude comprises:

resetting a current maximum amplitude by subtracting a set maximum amplitude from a previous maximum amplitude so as to prevent the collision of the piston.

20. (NEW) A method of controlling a linear compressor with a piston, a valve and a control unit, comprising:

detecting a collision of the piston with the valve according to at least a peak amplitude of the piston;

determining whether the collision of the piston occurs based on at least the peak amplitude of the piston, and resetting maximum amplitude data of the piston of the linear compressor when the collision occurs; and

controlling a maximum amplitude of the piston according to collision results of the piston.

21. (NEW) The method according to claim 20, further comprising:

storing a set amplitude value by electronic control and a reset amplitude value when the collision is determined.

22. (NEW) The method according to claim 20, wherein the detecting comprises:

detecting a position of a core by a differential signal provided by first and second coils when the core is linearly reciprocating by penetrating the first and second coils and the first and second coils are excited by an external source;

removing a high frequency component of the differential signal;

detecting a peak of the differential signal after the high frequency component is removed; and

outputting a detected result to the control unit.

23. (NEW) The method according to claim 22, wherein the detecting of the peak comprises:

rectifying the differential signal after the high frequency component is removed; and

smoothing the rectified differential signal.

24. (NEW) The method according to claim 22, wherein the detecting produces the differential signal proportional to a change in the position of the core by a magnetic coupling between the core and each of the first and second coils.

25. (NEW) The method according to claim 24, wherein the detecting comprises:

differentially amplifying output signals according to a detected position of the core;

calculating an amplitude of the piston based on the differentially amplified output signals;

calculating a displacement of the piston according to the calculating of the amplitude; and

outputting the calculated amplitude and the calculated displacement.

26 . (NEW) The method according to claim 25, further comprising:

preventing the collision of the piston with the valve by controlling the displacement of the piston and/or the amplitude of the piston by results of the detecting of the position of the core.

27. (NEW) A method of controlling a linear compressor with a piston and a valve, comprising:

setting a maximum amplitude value of the piston;

detecting a peak amplitude of the piston;

determining whether a collision of the piston and the valve occurs according to the detected peak amplitude of the piston; and

resetting a maximum amplitude value of the piston when the collision is determined; and

driving the piston according to the collision results of the piston.

REMARKS

STATUS OF CLAIMS:

Claims 1-7 were pending.

Claims 1-7 were rejected.

Claims 3-5 and 7 were indicated to be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. §112, second paragraph and to include all the limitations of the base and any intervening claims.